

WHAT IS CLAIMED IS:

1. A code reader to read a code from a data recording medium which records data as an optically readable code and is provided with a non-interference area around said code to prevent presence of only an interference image having an attribute causing an error during reading of said code, said code reader comprising:

an image pickup section to pick up said code;

a guide section configured to specify positional relationship between said image pickup section and said code;

a code detection section to set a code detection area in an image pickup screen obtained in said image pickup section and detect at least part of said code from the inside thereof; and

a restoration section to specify said code from said image pickup screen based on a detection position of at least part of said code detected in said code detection section and restore data recorded in said code, wherein

said code detection area is determined based on an alignment error between said image pickup section and said code due to said guide section and a specification of said code.

2. The apparatus according to claim 1, wherein said guide section allows part thereof as a guide

positioning section to touch a recording medium  
positioning section as part of said recording medium  
and determines a positional relationship between said  
image pickup section and the code.

5           3. The apparatus according to claim 2, wherein  
            said guide section is a slit, and  
            said data recording medium is shaped into a card,  
and inserting said card-shaped data recording medium  
into said slit determines positional relationship  
10          between said image pickup section and the code.

            4. The apparatus according to claim 2, wherein  
            said alignment error is determined by a contact  
error between a guide section and a recording medium in  
said guide positioning section.

15           5. The apparatus according to claim 2, wherein  
            said alignment error is determined by an assembly  
error of said image pickup section against said guide  
positioning section.

            6. The apparatus according to claim 2, wherein  
20          said alignment error is determined by a recording  
position error of said code against said recording  
medium positioning section.

            7. The apparatus according to claim 1, wherein  
            said non-interference area is widened on one of  
25          upper side and lower side of said code, and  
            said code detection section starts detection from  
the wider side of said non-interference area and

terminates detection when detecting part of the code.

8. The apparatus according to claim 1, wherein  
said code comprises a plurality of blocks,  
each of said blocks comprises an arrangement of  
5 a data area containing data divided from said data,  
a marker area containing a marker for identifying that  
block, and a block ID area containing block ID  
information for independently identifying that block,  
according to a specified positional relationship,

10 at least part of said code detected in said code  
detection section is said marker, and

said restoration section specifies said code from  
said image pickup screen in units of blocks and  
restores said divided data.

15 9. The apparatus according to claim 8, wherein  
said code is read by means of relative scanning  
with reference to said image pickup section,

said non-interference area is narrowed in a  
portion other than an edge used to start scanning said  
20 code, and

said code detection section provides a narrower  
code detection area used to detect the latter part of  
the code than a code detection area used to detect the  
beginning of the code during said scanning.

25 10. A code reader to read said code from a data  
recording medium which records data as an optically  
readable code, comprising:

an image pickup section to pick up a code;

an image detection section to detect a specified  
image from an image pickup screen obtained in said  
image pickup section, said specified image being  
5 provided near said code on a data recording medium and  
being positioned according to a specified positional  
relationship with said code; and

a restoration section to specify said code from  
said image pickup screen based on a detection position  
10 of said specified image detected in said image  
detection section and to restore data recorded in said  
code.

11. The apparatus according to claim 10, wherein  
said specified image is part of an adjacent code.

12. A data recording medium comprising:

a portion where data is recorded as an optically  
readable code; and

a non-interference area which is provided around  
said code and prevents presence of only an interference  
20 image having an attribute causing an error during  
reading of said code, wherein

said recording medium stores said code read by  
a code reader having an image pickup section to pick up  
a code, a code detection section to set a code  
25 detection area in an image pickup screen obtained in  
said image pickup section and detect part of said code  
from the inside thereof, a restoration section to

specify said code from said image pickup screen based  
on a detection position of part of said code detected  
in said code detection section and restore data  
recorded in said code, and a guide section configured  
5 to specify positional relationship between said image  
pickup section and said code, and

said non-interference area is determined based on  
said code detection area, an alignment error between  
said image pickup section and said code due to said  
10 guide section, and a specification of said code.

13. The medium according to claim 12, wherein

said data recording medium allows part thereof as  
a recording medium positioning section to touch a guide  
positioning section as part of said guide section and  
15 determines positional relationship between said image  
pickup section and the code.

14. The medium according to claim 13, wherein

said guide section is a slit, and

said data recording medium is shaped into a card,  
20 and inserting said card-shaped data recording medium  
into said slit determines positional relationship  
between said image pickup section and the code.

15. The medium according to claim 13, wherein

said alignment error is determined by a contact  
25 error between a recording medium and a guide section in  
said recording medium positioning section.

16. The medium according to claim 13, wherein

said alignment error is determined by an assembly error of said image pickup section against said guide positioning section.

17. The medium according to claim 13, wherein  
5       said alignment error is determined by a recording position error of said code against said recording medium positioning section.

18. The medium according to claim 12, wherein  
10       a data recording medium is read by a code reader in which said code detection section starts detection processing from a specified position in said code detection area and terminates detection processing when detecting part of the code, and

15       said non-interference area is widened on one of upper side and lower side of said code for said code detection section to start detection.

19. The medium according to claim 12, wherein  
20       said code comprises a plurality of blocks, and each of said blocks comprises an arrangement of a data area containing data divided from said data, a marker area containing a marker for identifying that block, and a block ID area containing block ID information for independently identifying that block, according to a specified positional relationship.

25       20. The medium according to claim 19, wherein  
      said data recording medium is read by a code reader which reads said code by means of relative

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scanning with reference to said image pickup section  
and provides said code detection section with  
a narrower code detection area used to detect  
the latter part of the code than a code detection area  
used to detect the beginning of the code during said  
scanning, and

said non-interference area is narrowed in a  
portion other than an edge used to start scanning said  
code.

21. A data recording medium comprising:

a portion where data is recorded as an optically  
readable code; and

the other portion, wherein

said recording medium stores said code read by  
a code reader having an image pickup section to pick up  
a code, an image detection section to detect  
a specified image from an image pickup screen obtained  
in said image pickup section, and a restoration section  
to specify said code from said image pickup screen  
based on a detection position of said specified image  
detected in said image detection section and to restore  
data recorded in said code, and

said specified image is provided near said code on  
a data recording medium and is positioned according to  
a specified positional relationship with said code.

22. The medium according to claim 21, wherein

said specified image is part of an adjacent code.

23. A card-shaped data recording medium  
comprising:

a portion which records visually readable images  
such as a character, symbol, figure, pattern, photo,  
5 etc.; and

a portion which records data as an optically  
readable code along a given cut side, wherein

a non-interference area is provided around said  
code to inhibit presence of only an interference image,  
10 out of said visually readable images, having an  
attribute causing an error during reading of said code,  
and

said non-interference area contains a longer width  
between said code and said cut side than a width  
15 between said code and said visually readable image  
arranged adjacently to said code.

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